Basques of to-day are more pure than the Spanish ; but they originally came from Spain. Although the Basque face is extraordinarily narrow, the head is broad ; but this is not due to a mixture with the Alpine race, as the Basque head is essentially dolichocephalic, the breadth occurring pretty far forwards near the temples. We have here, in fact, an example of a local modification (a sub-species of the Mediterranean stock) evolved by long-continued and complete isolation, in-and-in breeding primarily engendered by peculiarity of language, and perhaps intensified by artificial selection.

After having analysed the various European groups, Dr. Ripley devotes a couple of chapters to European origins and others to social problems, such as environment *versus* race, acclimatisation, and urban selection ; in the latter he discusses the tendency to long-headedness, shortness of stature and brunetness that characterises most large towns.

Dr. Ripley has presented us with a very valuable and most interesting study of the origins and physical characteristics of various European peoples, which is as indispensable to students of history and sociology as it is to anthropologists. The clearness with which he states and illustrates his facts leaves nothing to be desired, and we offer him our congratulations on having coped so successfully with an intricate problem, and on having brought his laborious researches to such a satisfactory conclusion.

The book is handsomely "got up," and is sumptuously illustrated. There are 222 carefully-selected portrait types, and 86 maps and diagrams. The selection of the portraits could have been no easy task, and the construction of the distributional maps must have entailed an infinitude of labour. The volume concludes with a bibliography on the anthropology and ethnology of Europe, which is as appalling as it is invaluable.

A. C. HADDON.

A REVISION OF CERTAIN CELL PROBLEMS.

Histologische Beiträge, Heft VI. : Ueber Reauktionstheilung, Spindelbildung, Centrosomen und Cilienbildner im Pflazenreich. Von E. Strasburger, o.ö. Professor an der Universität Bonn. Pp. xx + 224. Mit. vier litho. Tafeln. (Jena : Gustav Fischer, 1900.)

IT is with no small degree of pleasure that we have perused this, the latest, addition to the five series of "Histologische Beiträge," by Prof. Strasburger. The new volume, like some of its predecessors, deals almost exclusively with cell problems, and anything which its author may have to say on such matters must always command special respect. Breadth of treatment and open-mindedness, no less than thoroughness, have always characterised the work of this great investigator, and perhaps few who are not familiarly acquainted with the cell literature up to the early seventies can realise the extent to which our modern knowledge of cytological phenomena is indebted to the pioneer researches of the author of "Zellbildung und Zelltheilung."

In the volume before us, amongst other topics, the whole subject of what are now familiarly known as "Reduction-divisions" is treated afresh, and emphasis is laid on the need for a wider basis of comparison before we can return a satisfactory answer to the question as to whether the reduction is only *quantitative*, or whether as Weismann and his followers have supposed, it is *qualitative* also.

The majority of English and German botanical cytologists have decided in favour of the former view, and the researches of Flemming, Brauer, Meves and others on the animal side have shown that the opposite view is, at least, not always tenable. The case of the Salamander especially appears to be impossible of interpretation from the standpoint of the "Qualitative" hypothesis, and now Strasburger shows that the vitally important feature in the Salamander mitosis, viz. the *longitudinal* fission of the retreating chromosomes during the diaster stage of the first reduction division, is closely paralleled by the behaviour of the nucleus in the pollen mother cells of *Tradescantia*. Such a discovery is of the highest value as supporting the evidence already accumulated in favour of the merely quantitative character of these mitoses. The explanation which Strasburger gives of the structure of the ordinary V-shaped chromosome in the first reduction diaster will not, perhaps, gain general acceptance till it has been tested afresh. He believes that the original rod-shaped chromosome, divided longitudinally in two planes cutting each other at right angles, first splits completely into two daughter-chromosomes upon the spindle, and then that each of them opens out along the second plane of cleavage, only cohering at one end thus giving rise to the V-shaped chromosomes of the diaster. During the second division, the latter finish their longitudinal fission by complete separation of the limbs at the apex of the V, and thus what would appear to be a transverse fission proves to be merely the finish of a longitudinal splitting incepted at a much earlier period.

The author also discusses the nature of the causes which have brought about the difference of sex, and dismisses the "hunger" and autophagy hypothesis of Dangeard, which is, perhaps, a rather crude form of the less tangible but familiar theories of rejuvenescence. The view is supported that one important factor lies in the comparative absence of kinoplasm from the female, and of trophoplasm from the male, gamete. But it may, perhaps, be questioned whether the study of the evolution of sex in such forms as the green algæ does not favour the conclusion that such a difference is a result rather than a cause of sex-difference.

Incidentally, the view recently advocated by Němec, that the reproductive mitoses, in their early multipolar character, contrast with the universally bipolar vegetative divisions, is shown to be without foundation. Multipolar spindles occur both in pollen mother cells and in those of the root apex in *Vicia*, and the present writer has also observed them in the apical meristem of *Equisetum*.

The frequent connection of spindle fibres with extra-nuclear nucleoli is admitted, and is utilised to support the contention that these enigmatical bodies stand in a close relation to the kinoplasm which they are regarded as "activating." Many of the bodies which have, by different writers, been described as centrosomes are certainly nothing else than these escaped nucleoli, and in

the example of *Nymphaea*, in which the presence of centrosomes has recently been insisted on, Strasburger shows that not only can the occasional granules not be identified as centrosomes, but that the spindle often reaches to and ends on the peripheral layer of the cytoplasm in a multipolar fashion.

Naturally the bodies known as blepharoplasts are also brought under discussion. These structures have by some been identified with centrosomes, but they seem really to be but remotely related to them. The fact that, as was shown by Webber, the true spindle often becomes multipolar, notwithstanding the presence of blepharoplasts, tells strongly against their centrosomic character, whilst the fact that in the earliest stages radiations start from them proves absolutely nothing at all. Fischer has shown how heterogeneous bodies may serve as starting-points for radiations in fixed specimens of albumin; and Guignard has described and figured, in the case of the lily, similar radiations having the entire nucleus as their common centre. Much more definite is the relationship existing between the blepharoplasts and cilia. Strasburger, who regards them as essentially consisting of kinoplasm, adduces a series of observations in support of the view that they, or bodies like them, are constantly associated with cilia. Certainly it is a fact of no small significance that whilst, in ferns and cycads, they should be absent from all the other nuclear divisions, they are constantly present in those which directly lead to the formation of the motile antherozoids. Moreover, R. Hertwig has found an analogous relation to hold good for Actinospherium, stating that "centrosomes" only occur in connection with the polar (*Richtungs*) mitoses, whilst they are quite absent from the somatic divisions.

It is not possible to touch, even briefly, on all the points raised and illustrated in Prof. Strasburger's book; it is hoped, however, that enough has been said to indicate its importance as embodying, not only a considerable number of new facts, but also many new and suggestive points of view.

And throughout the volume one is struck, not only by the full recognition accorded to the work of other investigators in the same field, but by the invariable courtesy which characterises the author's criticism of their results even when these do not accord with those obtained by himself. J. B. FARMER.

MODERN POWER LOOMS.

Mechanism of Weaving. By T. W. Fox. Pp. xxii + 514. (London: Macmillan and Co., Ltd., 1900.)

THE second edition of this excellent book, on the construction and working of the power loom, has been carefully revised by the author. It has justly been recognised as a standard text-book on the subject of loom mechanism. The work treats of tappet, dobbie, and Jacquard or harness looms. In the first place, a full exposition is given of the tappet shedding motion, reference being made to the Yorkshire tappet loom, Woodcroft and segment tappets, and also to the different under motions for the depression of the heald shafts. Proceeding, Mr. Fox deals with some of the principal types of dobbies, such as the Blackburn, Keighley, Burnley and American. By means of sectional drawings, the somewhat intricate mechanism of these dobbies is clearly described. The work would have been enhanced to the manufacturer of heavy fabrics, such as linen, woollen and worsted textures, if fuller descriptions had been given of the dobbies employed in the weaving of these fabrics. Still, to the student of cotton weaving and the manufacturer of light fabrics, the information supplied will be found invaluable, and even the makers of heavier cloths might consult the pages on dobbies with profit. It is open to dispute whether the best method of treatment has been adopted, from a student's standpoint, in dealing fully with shedding motions, including the Jacquard, and card stamping, and the methods of tieing up the harness, before reference is made to other essential motions of the loom; but the plan of the author is evident on only a casual examination of the book, namely, to treat of each distinct motion in all its various forms in succession, excluding the possibility of affording the reader at the outset even a general notion of the combination of movements in power-loom weaving. This explains why some 280 pages, or more than half the book, should be devoted to the principles of shedding, card stamping and harness mounting, prior to any descriptive reference being made to the picking, the warp let-off, fabric take-up, shuttle, and other motions.

In dealing with the Jacquard loom, the single-lift machine—the basis on which all Jacquards are constructed—is first treated of; then follow descriptions of the double-lift, centre-shed, open-shed, twilling, Bessbrooke and cross-border machines. The doup and gauze harness are very clearly explained. Other systems of tie-up, more elaborately illustrated, might have been advantageously incorporated into this section of the work; but sufficient data is afforded to enable the student to grasp the principles on which the complex mountings are effected, necessary in the weaving of tapestry and decorative silk fabrics.

Lappet weaving receives adequate attention, especially as worked by means of lappet wheels and the Scotch method; but only brief details are given on other forms of this motion, in which lags are used and pegs of different lengths, and also in which the frames for carrying the lappet threads operate on the upper side of the fabric.

In regard to picking, Mr. Fox gives some interesting information on the magnitude of the force expended in propelling the shuttle from side to side of the loom. Perhaps there is no motion in weaving in which improvement is so desirable as in picking. This is more obvious in heavy looms, where large shuttles have to be used, travelling at a high speed. Under the head of "Warp Protectors," fast and loose reeds are considered, as well as shuttle guards. Many attempts have been made at automatic warp-stop motions, such as those applied to the Northrop and Poyser looms, but probably the author has not mentioned these on account of their not having come into general use in this country; still, there are principles in both interesting to the student of "Mechanism of Weaving."

The chapter on "Multiple Box Motions" is one very typical of the author's skill in the exposition of difficult mechanical problems. Revolving, as well as drop-box